**Title: It's a Jungle Out There!**

**Brief Overview:**

This learning activity involves identifying, predicting, sorting, counting, adding, organizing, graphing, analyzing, and displaying data. This data will be used to demonstrate student understanding of data analysis concepts.

**Links to NCTM 2000 Standards:**

- **Standard 1: Number and Operation**
  Mathematics instructional programs should foster the development of number and operation sense so that all students understand numbers, ways of representing numbers, relationships among numbers, and number systems; understand the meaning of operations and how they relate to each other; and use computational tools and strategies fluently and estimate appropriately.

- **Standard 5: Data Analysis, Statistics, and Probability**
  Mathematics instructional programs should include attention to data analysis, statistics, and probability so that all students pose questions and collect, organize, and represent data to answer those questions; interpret data using methods of exploratory data analysis; develop and evaluate inferences, predictions, and arguments that are based on data; and understand and apply basic notions of chance and probability.

- **Standard 6: Problem Solving**
  Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students build new mathematical knowledge through their work with problems; develop a disposition to formulate, represent, abstract, and generalize in situations within and outside mathematics; apply a wide variety of strategies to solve problems and adapt the strategies to new situations; and monitor and reflect on their mathematical thinking in solving problems.

- **Standard 7: Reasoning and Proof**
  Mathematics instructional programs should focus on learning to reason and construct proofs as part of understanding mathematics so that all students recognize reasoning and proof as essential and powerful parts of mathematics; make and investigate mathematical conjectures; develop and evaluate mathematical arguments and proofs; and select and use various types of reasoning and methods of proof as appropriate.

- **Standard 8: Communication**
  Mathematics instructional programs should use communication to foster an understanding of mathematics so that all students organize and consolidate their mathematical thinking to communicate with others; express mathematical ideas coherently and clearly to peers, teachers, and others; extend their mathematical knowledge by considering the thinking and strategies of others; and use the language of mathematics as a precise means of mathematical expression.

- **Standard 9: Connections**
  Mathematics instructional programs should emphasize connections to foster an understanding of mathematics so that all students recognize and use connections among different mathematical ideas; understand how mathematical ideas build on one another to produce a coherent whole; and recognize, use, and learn about mathematics in contexts outside of mathematics.

- **Standard 10: Representation**
  Mathematics instructional programs should emphasize mathematical representations to foster an understanding of mathematics so that all students create and use representations to organize, record, and communicate mathematical ideas; develop a repertoire of mathematical representations that can be used purposefully, flexibly, and appropriately; and use representations to model and interpret physical, social, and mathematical phenomena.

**Grade/Level:**

Grades 1-3

**Duration/Length:**

1-3 days -- Each activity varies in length.

**Prerequisite Knowledge:**

Students should have working knowledge of the following skills:

- Working cooperatively
- Estimating
- Number sense
- Expressing ideas

**Student Outcomes:**

Students will:

- work cooperatively.

- develop vocabulary of probability.
- experiment with probability.
- use logical reasoning to form opinions.
- use number sense to find relationships between numbers.
- apply learning to real life experiences.
- communicate math findings orally and in writing.

**Materials/Resources/Printed Materials:**

- Teacher Resource Sheet # 1
- Student Resource Sheets #1-2
- Crayons
- Scissors
- Pencils
- Animal Crackers
- Glue
- Paper for graphing
- Brown paper bags

**Development/Procedures:**

**Motivation:**
After a trip to the zoo, have the class make a list of the animals they saw. If a zoo is not available for a field trip, you may read a book about a zoo trip. You may also choose to sing animal song such as *Old McDonald Had a Farm* or *Going to the Zoo*. Tell students that for the next few days they will be working in small groups to analyze animal crackers that you have placed in a bag.

**Day 1**

Randomly, put a handful of about 20 animal crackers in a brown paper bag. Give each bag to a group of 4-5 students. Tell students that they cannot eat the crackers in the bag and that they will receive their own later at the end of the activity.

**Steps:**

1. Give each student a copy of Student Resource Sheet #1 and then allow some time for him or her to reflect and to discuss in response to the worksheet.
2. After the discussion, have students predict how many whole animal crackers there are inside the bag and record their own predictions on Student Resource Sheet #1.
3. Now the students can open the bag, sort and count the contents by tallying the different animals and recording their data on Student Resource Sheet #1.
4. Have students write their names on bags; and collect the crackers and discuss students' findings.

**Day 2**

Redistribute the animal crackers to the same group of 4-5 students. Remind them not to eat the crackers.

**Steps:**

1. Give each group of students a large sheet (11" x 14') of construction paper and glue. Student Resource Sheet #2 is an example to be copied onto the construction paper.
2. Have students sort and glue the animal crackers onto the large sheet of construction paper to make a pictograph. (You may have to enlarge the chart if space provided is not big enough for crackers.)
3. Ask students to compare and explain their work on the construction paper with what they see on Student Resource Sheet #1 from yesterday.
4. Collect their work for display.
5. Have students write three or more sentences about their graph.

**Performance Assessment:**

The students will complete the assignments. Assessment can be completed through the teacher's oral and written observation. This activity can be done over a period of 2-3 days at the teacher's own discretion. Refer to Teacher Resource #1 for the scoring rubric.

**Extension/Follow Up:**

There are numerous other ways to expand this lesson. Students could:

- Make an animal cracker spinner, spin and record their data.
- Make a survey of their favorite animals and graph the results.
- Students can dramatize different animals and have other students guess them.

**Authors:**

Sokteang Lim
Bancroft Elementary School
District of Columbia/Wash. DC

Donna Lee Marsden
Emery Elementary School
District of Columbia/Wash. DC

Name:_____ Date:_____

# Animal Crackers Tally

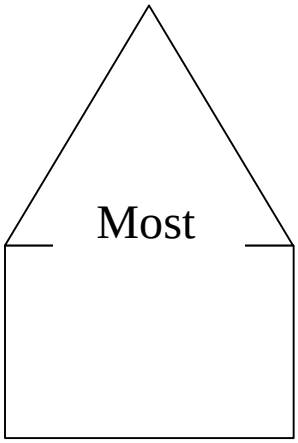
Let's find out how many different animals are here.

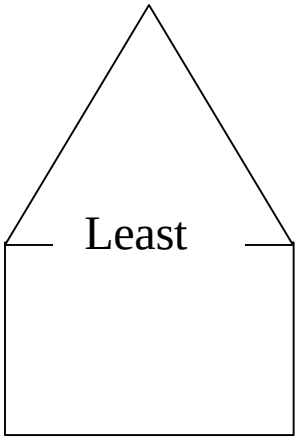
My predictions: _____ _____

(word amount) (number)

| Animal Name | Amount |
|---|---|
| 1._____ | _____ |
| 2._____ | _____ |
| 3._____ | _____ |
| 4._____ | _____ |
| 5._____ | _____ |
| 6._____ | _____ |
| 7._____ | _____ |
| 8._____ | _____ |

Total =



Student Resource Sheet #2

Name:_____ Date:_____

# Animal Crackers Plot

(This is an example to be done on construction paper.)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Bears** | | | | | | | | | |
| **Elephant** | | | | | | | | | |
| **Lions** | | | | | | | | | |
| **Monkeys** | | | | | | | | | |
| **Pigs** | | | | | | | | | |
| **Tigers** | | | | | | | | | |

Key: _____

## Rubrics for Student Resource Sheet #1

| 2 points | 1 point | 0 point |
|---|---|---|
| ❑ Students can express 2 or more ways of solving the questions.<br>❑ Students sort and tally all correctly.<br>❑ Work was neat.<br>❑ Written prediction was done. | ❑ Students can give only one way of solving the questions.<br>❑ Students sort and tally some correctly.<br>❑ Work was neat.<br>❑ Written prediction was done. | ❑ Students have no response.<br>❑ Students were unable to sort and tally correctly.<br>❑ Work was not neat.<br>❑ Written prediction was not done. |

## Rubrics for Student Resource Sheet #2

| 2 points | 1 point | 0 point |
|---|---|---|
| ❑ Students pasted animals neatly and correctly.<br>❑ Students can explain the data correctly.<br>❑ Students can distinguish between least and most. | ❑ Students pasted animals neatly and correctly.<br>❑ Students can explain some data correctly.<br>❑ Students cannot distinguish between least and most. | ❑ Students pasted animals correctly.<br>❑ Students can count some data correctly.<br>❑ Students cannot distinguish between least and most. |